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AUTHOR	Doering, Aaron; Beach, Richard
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ABSTRACT

This article analyzes the uses of various technologies to enhance literacy practices using a multi-genre writing project with pre-service teachers and middle school students. Twenty-seven English pre-service teachers, simultaneously enrolled in a methods and a technology course, collaborated with middle school students using asynchronous Web discussion to develop hypermedia projects that fostered and promoted the use of technology as a tool. These tools mediated the uses of various literacy practices within the larger activity system of teacher education, whose object is to assist teachers to acquire those practices involved in working effectively with students. Qualitative data were collected through analyzing pre-service teachers' development of Storyspace hypermedia projects, the use of asynchronous discussion with their middle school students, and participation on a WebCT bulletin-board discussion. The hypermedia productions with middle school students helped the pre-service teachers learn how to model the literacy practices of making intertextual or hypertextual links. The Web-based communication with students helped pre-service teachers develop relationships with students in the absence of face-to-face interaction. And, through participation in the WebCT bulletin board, pre-service teachers employed different literary practices ranging form the display of spontaneous thinking to engaging in word/role play. (Contains 46 references.) (Author/AEF)

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Co-Inquiry Approach to Learning and Using Hypermedia

Aaron Doering
Richard Beach
University of Minnesota

ED 470 161

Abstract:

This article analyzes the uses of various technologies to enhance literacy practices using a multi-genre writing project with pre-service teachers and middle school students. Twenty-seven English pre-service teachers, simultaneously enrolled in a methods and a technology course, collaborated with middle school students using asynchronous web discussion to develop hypermedia projects that fostered and promoted the use of technology as a tool. These tools mediated the uses of various literacy practices within the larger activity system of teacher education, whose object is to assist teachers to acquire those practices involved in working effectively with students. Qualitative data were collected through analyzing preservice teachers' development of Storyspace hypermedia projects, the use of asynchronous discussion with their middle school students, and participation on a WebCT bulletin-board discussion. The hypermedia productions with middle school students helped the preservice teachers learn how to model the literacy practices of making intertextual or hypertextual links. The web-based communication with students helped preservice teachers develop relationships with students in the absence of face-to-face interaction. And, through participation in the WebCT bulletin board, preservice teachers employed different literary practices ranging from the display of spontaneous thinking to engaging in word/role play.

Literacy Practices and Technology Tools

A preservice teacher and a middle-school student are exchanging messages on a web-based bulletin board about a biography project they are working on together on the topic of Princess Diana. The student posted the following message:

> Last night I went on the Internet and found a lot of stuff like her will, and her divorce papers and some poems some people wrote about her. I also fond some pictures of when she was younger.

The preservice teacher responded:

> Last night I bought a couple of books about Princess Diana that were on sale at the bookstore. One contains a bunch of short little memories of her written by all sorts of people that knew her in her lifetime. I will also print at least 2 articles from the Internet that will be helpful (not too long) for us to think about what we want to write about.
>
> See you Wednesday.

This on-line exchange was part of a project involving preservice English teachers working in a semester-long practicum experience with a group of middle-school students, a project that involved extensive uses of technology. Their on-line exchange entails uses of literacy practices such as sharing information and planning activities, practices central to a co-inquiry writing project. This project represents the increasing use of technology as a tool for linking adults with students in schools, an approach that is highly relevant to teacher education.

In many teacher education programs, in addition to their student teaching, preservice teachers are required to complete practicum experiences that involve minimal face-to-face interaction with students. Technology can enhance preservice teachers' interaction with students, as well as providing students with positive learning experiences through technology. For example, in the "Fifth Dimension" after-school computer-mediated program operated by the University of California, San Diego, participation in an elaborate set of computer games and activities resulted in increased student engagement, participation, and learning within a community (Cole, 1999). In this program, University undergraduates serve as "Wizards" who guide students through a "maze" of activities based on the students' zone of proximal development.

Educators are also employing web-based tools to foster on-line discussions between teachers regarding issues faced in their programs or in the classroom. The Inquiry Page housed at the University of Illinois <http://inquiry.uiuc.edu/> is designed to help teachers share teaching successes and collective expertise (Bruce & Davidson, 1996; Bruce & Easley, 2000). Teachers engage in mutual inquiry through their access to resources on teaching and learning, articles, project links, curriculum units, and content resources. Users of the site are themselves the developers who reconstruct the tool as they use it. Participants may also share video, photos,

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graphics, texts showing people engaged in inquiry in different settings and access resources involving a dynamic incorporation (using Digital Windmill) of the Open Directory category on Inquiry Based Learning.

This site represents new generation of web design that serves the social needs of teachers to mutually engage them in co-inquiry about problems, issues, or dilemmas. Research on uses of these sites indicates the importance of quality of the social interaction in this on-line co-inquiry. For example, Barab and Schatz (2001) analyzed the development of a web-based learning site designed to foster sharing of inquiry-instruction ideas by Indiana math and science teachers in terms of the components of evolving activity systems. This web site was initially designed as a tool by University educators to achieve the object of more discussion/sharing about inquiry instruction with the outcome being improved understanding of inquiry-based instruction. However, given the lack of participation, the University educators, along with teacher participants, shifted the focus of the web site to emphasize participants' mutual collaboration at the site around inquiry-based math/science instruction.

In this report, we examine the various literacy practices that were fostered through the uses of technology tools that included web-based bulletin-board exchanges and hypermedia productions. We hope to demonstrate that technology tools can serve to mediate and foster the development of a range of different literacy practices within a teacher education program.

Technology Tools as Mediating Literacy Practices

Social-cultural activity theory of learning (Cole, 1996; Engestrom, 1987; Wertsch, 1998) posits that learning occurs through social uses of various tools --language, signs, images, texts, as well as technology tools. Activity theorists believe that people learn the uses of these tools by learning how they are linked to the objects or outcomes driving a specific activity within an "activity system." Russell (1997) defined an activity system as: "any ongoing, object-directed, historically conditioned, dialectically structured, tool-mediated human interaction. Some examples are a family, a religious organization, a school, a discipline, a research laboratory, and a profession" (p. 510).

Central to activity theory of learning is the idea that these tools function to mediate learning of literacy practices (Bruce & Levin, 1997). Students learn to use a range of tools to engage in these literacy practices. Work in the field of "distributed cognition" (Hutchins, 1993) posits that certain practices associated with an activity become embodied or "distributed" in tools. For example, navigational instruments are used to capture what is known about navigating the seas. They then serve as tools that guide a ship based on human knowledge about navigation. Similarly, expert computer systems are built on experts' knowledge about a certain phenomena such as diagnosing a particular disease. Tools are therefore used within an activity to function as extensions of certain practices involved in an activity (Vygotsky, 1978). We turn now to discuss examples of how learning the following literacy practices are mediated through technology tools:

Defining intertextual connections. One basic literacy practice involves defining intertextual links between texts. In defining intertextual links, people define connections between texts in terms of similar images, characters, topics, or themes. Roland Barthes (1970) argues that "Every text, being itself the intertext of another text, belongs to the intertextual...the quotations from which a text is constructed are anonymous, irrecoverable, as yet *already read*" (p. 443).

Students are engaged in making intertextual links in through multi-genre writing about a topic, an approach currently popular in secondary writing instruction (Romano, 2000). Multi-genre writing involves using a range of different types of genres—reports, poems, letters, diaries, stories, advertisements, field notes, photos, drawings, etc. to explore different aspects of and perspectives on a topic. Connecting these disparate genre types requires the ability to determine how different types of texts yield different perspectives on the same topic or phenomenon.

One technology tool that mediates the practice of making intertextual links is hypermedia. Hypermedia functions as a tool by combining hypertext (texts linked together by multi-linear nodes) and multimedia (photos, video, art, audio, text, etc.) to produce an interactive media experience for participants (Jonassen, 2000; Landow, 1997). Because hypertext allows participants to choose optional paths through multimedia, participants can both construct and respond to hypermedia interactively. Students often respond positively to hypermedia texts because it is consistent with their everyday experiences with multi-modal environments that combine images, animation, video, music, and texts (Myers & Beach, 2001).

In an essay about the pedagogical implications of this shift towards hypermedia, Jay Bolter (1998) argues that hypermedia challenges the traditional emphasis in literacy instruction on understanding or producing unified, coherent texts based on a definitive, single perspective. He calls for an alternative focus on teaching a "rhetoric of expectations and arrivals" (p. 10) that help students understand where certain links may take them and how they should respond to where they arrive. And, given the important role of graphic representations in hypermedia, he

posits the need for often-marginalized art and video-production instruction to help students respond critically to images.

Producing hypermedia texts using tools such as Storyspace ™, HyperStudio™, HyperCard™, and various web authoring programs, involves defining intertextual links between a range of different types or genres of texts (McKillop & Myers, 1999; Myers, Hammett & McKillop, 1998; 2000). For example, high school students represented their experiences with peers through combining photos, music, video clips, and texts to interpret short stories (Beach & Myers, 2001; http://www.ed.psu.edu/k-12/socialworlds/).

Hypermedia can also assist in organizing links around central themes or topics in writing instruction. Analysis of first-year college writing class students' construction of hypertexts indicated that students structured information around central ideas and illustrated that idea through links to other texts or graphics (Duguay, 1999). Using the hypertext as a tool, helped students define links between diverse parts of their hypertext because the links made it visually easier to connect the ideas.

Researchers have also examined the nature and types of links constructed in hypermedia production, as well as the social motivation to construct these links within the classroom as an activity system. In one study, 16 seventh graders 18 preservice teachers used StorySpaceTM to combine original poems, images, and QuickTime movies to explain the various literacy devices used in poetry (McKillop & Myers, 1999). The types of links employed in the hypermedia productions were analyzed in terms of their functions—an "iconic function" was used to illustrate another text, an "indexical function" was used to extend a text to show shared meaning, and a "symbolic function" was used to question the meaning of a text which resulted in a greater understanding of or a critical analysis of a text. Most of the seventh graders' links served as iconic illustrations of ideas in poems. There were far fewer instances of links reflecting critical analysis, for example, when students juxtaposed texts to generate contested meanings. The undergraduates were more likely to employ links serving a "symbolic function" that involved critical analysis of texts. This study suggests that users employ links for different purposes representing different levels of critical thinking.

Ryan (1999) examined in college students' construction of hypermedia links using HyperCardTM to write a "Literary Journal" biography of an American author based on a range of different sources and information about that author's life, as well as comments on other students' work and supplementary material. In contrast to the essay format that often constrains exploration of alternative, conflicting perspectives, the hypertext format fostered exploration of alternative, conflicted perspectives about an author's life that resisted closure.

Nancy Patterson's (Patterson, 2000) middle school students at Portland Middle School, Portland, Michigan, used Storyspace™ to construct hypertexts based on research on American history and culture (http://angelfire.com/mi/patter/america.html). Students created hypertext narratives with links to information about slavery. As Patterson notes (http://www.npatterson.net/mid.html), working with Storyspace™ shifted students away from simply rehashing information about persons to understanding people and events as shaped by historical and cultural forces.

Posing questions. Another literacy practice involves posing questions related to exploration of issues, topics, concerns, or dilemmas (Beach & Myers, 2001; Short & Harste, 1996; Smithson & Dias, 1996). In teacher/students journal dialogue exchange, teachers pose questions designed to encourage students to elaborate on their answers or explore other perspectives, modeling heuristics for exploring topics. Overtime, students internalize these questions and employ them in their own writing, resulting in increased elaboration in their writing (Peyton & Staton, 1993). Computer-mediated written communication between teacher and student can serve as a tool for teachers to engage in similar dialogue-journal writing modeling of question-asking (Beach & Lundell, 1998).

Adopting multiple voices and perspectives. Another basic literacy practice involves adopting multiple voices and perspectives through making "double-voice" intertextual references or evoking or mimicking the languages or styles from other texts or worlds (Bakhtin, 1981; Knoeller, 1998). Speakers and writers employ these intertextual references to establish social relationships and identities (Bloome & Egan-Robertson, 1993). Through interaction with others, participants construct identities by performing in ways that position them in relation to others' positions--"it is in the connection to another's response that a performance takes shape" (McNamee, 1996, p. 150). As Bakhtin (1981) argued in his concept of "answerability," people's utterances reflect their relationships with others' potential, anticipated reactions to their utterances. In participating with a range of diverse perspectives and voices in a computer-mediated context, students learn to consider alternative perspectives different from their own (Taylor, 1992). The more open students are to experimenting with alternative ways of being and knowing, the more open they are to entertaining alternative values, as opposed to a rigid, monologic perspective on the world (Lewis & Fabos, 1999).

Adopting a collaborative, inquiry stance. In conducting discussions with students, teachers attempt to adopt a collaborative, exploratory stance that serves to invite mutual exploration with students. Adopting this stance requires teachers to balance their status as authority figure with the need to establish a relationship with students. As Deborah Tannen (1984) notes, in this negotiation, participants may use conversation as "symmetrical"--to maintain equal status, or, as "asymmetrical"--to establish a dominant/subordinate relationship. On-line discussions serve to minimize some of the nonverbal aspects creating "asymmetrical" status differences in face-to-face interactions (Walther, 1996). Differences in uses of "asymmetrical" practices may also be related to gender stances. Analysis of college classroom discussions indicated that females were more likely to employ "task-continuative" practices comprised of questions and answers, validation of others' comments, back-channel comments, repetition, extension, supportive laughter, extended development or talk than were males (Bergvall & Remlinger, 1996).

The ability to adopt collaborative, exploratory stance depends on participants' willingness to be open to entertaining others' beliefs as valid and rational, something that what Donald Davidson (1984) refers to as the "principle of charity" (p. 126). As Porter (2001) notes, "because communicators cannot assume shared meanings..., they must assume a shared world; if they assume that they share neither a language nor a world, there would be no possibility for communication" (p. 586). It also requires the ability to frame statements of beliefs or opinions as tentative hunches or hypotheses —what Davidson (1984) refers to as "passing theories" (p. 45). The concept of "passing theories" refers to the idea that participants are willing to modify their established "prior theories" to be open to entertaining and integrating others' beliefs into one's own beliefs (Dasenbrook, 2000). In classroom discussions of literature, when students framed a new topic in a tentative, exploratory manner, other students were more likely to follow up on that topic than when the topic was framed in a definitive manner (Beach & Phinney, 1998). Synchronous computer-mediated classroom interaction in a seventh-grade classroom served to foster students' mutual exploration of tentative ideas and perspectives because they were simultaneously brainstorming together in the same chat site; adopting a hard-line stance was socially unacceptable in this exchange (Beach & Lundell, 1998).

This research indicates that a range of different literacy practices can be fostered through uses of technology tools. This raises the question as to whether technology tools can be used in a teacher education activity system whose object is to foster preservice teachers' ability to acquire and teacher these literacy practices.

Preservice English Teachers' Participation in a Co-Inquiry Multi-Genre Writing Project

This research project examined the question as to how one group of preservice teachers used technology tools to acquire various literacy practices involved in working with middle-school students in a multi-genre writing project.

The participants in this project were 27 preservice English teachers enrolled in a composition-methods course taught by Beach and an instructional technology course taught by Doering in the Fall Semester, 2000 at the University of Minnesota. Preservice teachers [hereafter "teachers"] in the composition methods course learned various strategies for engaging in inquiry-projects and for teaching multi-genre writing. The purpose of the instructional technology course was to help teachers acquire a set of technology tools they could employ in teaching English.

In conjunction with these courses, participants were engaged in a semester-long practicum experience in a magnate middle school that draws students from a wide range of both urban and suburban districts in the St. Paul, Minnesota area. The school curriculum is organized around interdisciplinary inquiry projects in which students are engaged in constructivist exploration of topics across different subjects. The students represented a wide range of socio-economic backgrounds and ability levels, with many students testing at a relatively low reading level. The teachers each worked during weekly visits with one or two students in each of two different class periods.

A multi-genre writing project. The teachers and middle-school students worked together on a multi-genre project involving writing a biographical sketch, a newspaper report, and a narrative about famous people ranging from Martin Luther King Jr. to Princess Diana. They conducted research about their person using the Web and other sources based on questions posed about the person, generating information they used to write a biographical sketch. Students then wrote a newspaper article about some aspect of or even in the person's life employing ClarisWorks to create a news article format. The project concluded with students writing a fictional narrative about their person in which they adopted that person's or another person's first-person point of view to describe some event in the person's life. This required students to imagine the person's subjective experience in an event, along with descriptions of dialogue; setting; and the person's feelings, attitudes, and beliefs about the event.

For the final presentations of their multi-genre projects, the students shared the results of their work in short ten-minute presentations in small groups. Students employed a range of multi-modal presentations acting out a scene from their lives, a skit, interview the person, a piece of art in the person's form; an overhead, slide presentation, news report/sportscast, and dramatic reading.

Hypermedia production. As part of their instructional technology class, the teachers created their own hypermedia production based on their students' multi-genre writing. They used Storyspace™ (Bolter, Smith, & Joyce, 1990) as a tool to develop and link multimedia material within windows that can include or be embedded in other hierarchical windows. (Given the lack of access to computers in the middle school, and the expense of the Storyspace™ software, the teachers, in discussion with their middle-school students, developed the hypermedia versions of the multi-genre writing at their University site. In an ideal situation, the teachers and the students would have developed the hypermedia at the middle-school site.)

Constructing the hypermedia production to share with their students involved a shift in role for the teachers from purveying knowledge to demonstrating their "knowledge by design" (Perkins, 1986). This change in learning when using hypermedia sometimes causes problems as learners struggle to integrate the information they are learning into a hypertext document (Jonassen, 2000). To explore their knowledge as related to their audience, they initially developed concept maps using Inspiration™ to represent their knowledge prior to creating the hypermedia production. These concept maps were used as guides to help the teachers choose what links they believed were important as well as what types of media they may want to employ (graphics, video, sounds) to represent their knowledge in StorySpace™

The hypermedia productions were analyzed by the investigators in terms of the types of texts—images, written texts, sounds, etc., teachers included in their productions, as well as the types of links they employed in connecting these texts.

Web-based teacher/student communication. As part of a federally funded technology-development program, an asynchronous Web-based teacher/student communication site was created to foster communication between the teachers and students during the time when they were not working with each other in school. To address potential security and privacy issues, pupils would click on the name of their assigned student and then engage in conversation about their projects or personal matters. Only the pupils assigned to the teachers could access those particular teachers. Because the communications were asynchronous, teachers and the middle school students could post and respond to questions relating to their cooperation on the project at any time.

Transcripts of the web-based communications were analyzed in terms of the amount of participation as determined by the number of comments employed, defined in terms of a complete thought unit, a procedure employed by Diane Schallert in her research on on-line communication (Schallert et al, 2001). Each "thought-unit" was also analyzed using a constant comparative method (Glaser & Strauss, 1967) to guide the development of the significant categories and patterns in the data in terms of the types of topics discussed and the literacy practices employed. The types of topics and practices were then crosschecked with an experienced English teacher for further verification (Merriam, 1998).

WebCT bulletin-board discussion. The teachers also participated in an asynchronous discussion on the course WebCT site. For this site, teachers were asked by the course instructor to make at least one posting a week; they were told that they could respond to topics or issues in the course discussions, readings, or practicum experiences, as well as other topics outside the course. The instructor hoped that through participation in this bulletin board exchange, students would gain some experience with uses of a bulletin board as a learning tool for use in their own future teaching. The instructor also hoped that the students would acquire an understanding of how writing is driven by social purposes or needs related to participating in a community constituted through a bulletin board exchange. Transcripts of the WebCT discussion were analyzed in terms of the types of literacy practices employed in the exchanges using the same analysis methods employed with analysis of the teacher/student interactions.

Results

Hypermedia Productions

Development of the initial and following nodes. Analysis of the hypermedia productions based on the students multi-genre writing projects indicated that 80 percent of the teachers began their multimedia development with a picture of the person with links to the "major nodes" or events of the person's life. It was these major events that lent themselves to links where the students explained the person in more detail using various medias. For example, one student studying Martin Luther King, Jr. began their multimedia development with a picture of Martin

Luther King, Jr. with four links underneath the picture to take them to nodes about "Enemies and Resistance," "Awards and Supporters," "Biographical Information," and "Civil Rights Efforts." Each one of these four major nodes had a short written description that explained Martin Luther Kings Jr's relationship to each node. In the "Civil Rights Efforts" node, the teacher developed five sub-nodes that described Martin Luther King Jr.'s efforts. These nodes included "Sit-in Demonstrations," "Passive Resistance," "Montgomery Bus Boycott," "Writings," and "Marches and Speeches." Within each of these nodes, the teacher used images, texts, or clips to represent the civil rights theme. Within the "Writings" node, the teacher listed and included writings from Martin Luther King Jr's books. These writings were obtained through searching the Internet and incorporated within a separate "exploding" Storyspace ™ node. To represent the "Montgomery Bus Boycott," the teacher decided to use a video clip she also obtained from the Internet and to represent the "Passive Resistance" theme; she scanned in pictures that were obtained through a family trip. Teachers integrated a wide range of media texts into their productions, frequently selecting texts most readily available from the World Wide Web.

Other teachers chose to limit their biography to detailed portrayals of a specific period in person's life because information about that period was more available and they preferred to develop a specific aspect of a person's life. As one teacher indicated in her learning log, she would rather research the person's life "using depth, rather than breadth, and develop an understanding that was more meaningful."

Analysis of the links employed. The 27 projects indicated that the most common approach to linking was directly from a picture or words that described themes for analysis placed under a picture. For example, when placing a picture of the "Montgomery Bus Boycott" in a node, a reader would click on the picture to move to an explanation of the boycott and then link back to another node with another theme when finished. Sixty-five percent of the teachers used this approach of simply linking images and texts without use of hypertext links from individual words.

The other thirty-five percent of the teachers used hypertext links in which certain words were linked to other words or texts. One teacher described the life of John F. Kennedy and made links to words that they found most difficult for a reader to outside nodes that either described the word through text, a graphic, or both. The words that were linked were words that the teachers believed would improve the students' reading experience or that they found most interesting. Of the 35 percent that used hypertext links for development, over 80 percent of them had five or more links within each biographical description. The words that were most commonly linked were those that the teacher believed would provide background knowledge for readers assumed to have no previous knowledge of the person. An example is the links in the nodes on John F. Kennedy, which included the "Cuban Missile Crisis," "Bay of Pigs," "Marilyn Monroe," "Fidel Castro," and "Camelot." All of these words were linked to additional nodes that explained John F. Kennedy's relationship to each of these nodes.

Analysis of the media employed. All teachers used digital pictures copied from the Internet or scanned from a book. Thirty percent of the students also used QuickTime movies obtained from the Internet that showed the event in detail. As they indicated in their learning logs, teachers believed that these video clips effectively conveyed ideas they wanted to portray about their person. In addition to pictures and movies, 20 percent of the teachers used sound clips that they prerecorded using SoundEdit Pro ™ or that they captured from the Internet to add narration to their project.

Through these hypermedia productions based on the students' writing, the teachers were using multi-media links to model uses of technology for their students as a tool for portraying a range of different biographical elements of their subjects' lives

Web-based Communications between Teachers and Students

Building personal relationships. Analysis of the web-based communication between teachers and students indicated that the teachers initiated all the comments on the asynchronous discussion board. The initial conversations during the first two weeks of the semester typically began with three-to-five sentence personal anecdotes that served to help establish a personal relationship between the teacher and students. The interaction and writing style during these initial exchanges was relatively formal.

Many of the middle school students described how they enjoyed the ability to communicate on-line to build a better relationship with the teacher before they started the co-inquiry multimedia project. One student said, "because we're able to communicate online, it was easier to get to know the practicum teacher because it gave me more time to think about what I would want to know from them and how I might want to answer their questions." Another student said, "I was always excited to check the discussion area when I got home so I could see if my practicum teacher had sent me a message back." The middle-school students expressed some disappointment to

their teachers when the teacher did not respond immediately to their posting, an indication of their interest in hearing from their teacher.

Planning and development. As illustrated by the initial example of work on the Princess Diana project, as the semester progressed, the conversations focused more on planning and developing the multi-genre writing project. While the students normally posed a topic that was directly related to the media and the popular culture, many of the teachers encouraged students to select topics that they found, as one teacher noted, "would be more meaningful and easier to obtain quality information." During these exchanges, the sentences became much shorter than during the initial exchanges, with incomplete one to two sentence responses. The interaction and writing style also became more informal.

The discussion board served to support the teachers and students in sharing ideas about the content of their multi-genre writing project, sharing involving literacy practices such as posing questions. In the exchanges, teachers frequently posed questions to students regarding further elaboration about their projects, questions that they may then have internalized to think about different aspects of their projects.

The assignment of working with two to four students, each of who was creating a different project was a bit overwhelming for the pre-service teachers. The discussion board helped the teachers monitor the students' progress on the project to insure that they completed it on time. Some of the teachers commented on the convenience of being able to send multiple messages to the middle school students and determine their progress through their responses. As one teacher noted, " I am able to keep in constant communication with them up to the days I meet with them. We are then able to get much more accomplished as we have been communicating and know what the plan is when we will see each other."

Frequency of exchange. In the exchanges on the multi-genre project, the teachers were more likely to dominate the discussion. Seventy percent of the conversation focused on direction and control comments where the teachers were guiding the students in their research asking them about the progress they were making on research or reminding them what was due the next time they were able to meet. When responses were elicited on research progress, 85 percent of sharing included Internet addresses where students had found information they believed could contribute to the final project.

Analysis of the exchange based on gender differences indicated that male and female students who collaborated with female teachers had a 35 percent greater quantity of discussions overall than with male teachers. Students were also 52 percent more likely to employ what was categorized as "personal" topics with female teachers than with male teachers. There was also a difference within the student group; female students communicated more frequently and also contributed more project-related information than their male counterpart.

Analyzing all of the asynchronous discussions, teachers employed 73 percent of "thought units," while students contributed only 27 percent. Overall, the focus of the discussions moved from initial personal conversations to project-related conversation during the middle of the semester to personal conversation at the end of the semester.

Given the infrequency of face-to-face meetings during the practicum, this web-based communication served to enhance the quality of teacher/student relationships and provide for frequent collaboration on the project. Through this experience, both teachers and students learned to perceive the value of web-based communication as a tool for engaging in collaborative co-inquiry.

Teachers' WebCT Bulletin Board Communication

Analysis of the topics addressed in the WebCT class bulletin board exchanges indicated that teachers used the exchanges to discuss a range of different issues, particularly those associated with education: teachers as role models, vouchers, censorship, testing, etc. And, teachers shared their experiences with working in the middle-school practicum, as well as personal experiences. In doing so, they employed a number of literacy practices that served to foster productive exchanges:

Display of spontaneous thinking. Teachers used the postings to openly think through a topic or issue, creating a written record of their unfolding thought. Rather than formulate their ideas prior to writing and then write an organized statement, teachers were spontaneously writing out their thoughts in a free-writing mode. They would then entertain alternative, even contradictory perspectives as they formulated their thoughts in a posting. For example, in discussing the issue of teaching expository versus narrative forms to middle-school students, one teacher, responding to another teacher's belief in the value of narrative writing, noted:

As we discussed in class earlier, there is clearly something going on with my middle-school student that makes the narrative form a richer expressive medium for him. I will, of course, take a look at your link. Also, I would like to see more of the research on this. The stuff we 've gotten in the program points specifically to class-

differentiated processing. But your post suggests that there is also research pointing to a broader conclusion. But before I do I wanted to affirm your idea about narrative processes superseding linear logical processes in decision-making. I know for myself that the work that I do with I am reflecting on a difficult problem often resembles a conversation more than a reasoned, bulleted list. I wonder where conversational dialogue fits in this paradigm? It's not really narrative, but God knows, it ain't logical! Anyway, I shouldn't say more 'til I've read some. More later.

The spontaneous nature of his thinking is evident in the fact that he poses questions to himself ("I wonder where conversational dialogue fits in this paradigm?" which then stimulate him to further thinking about the issue. He also openly reports on the fact that "I shouldn't say more 'til I've read some," implying that he will continue to think further about the topic.

The fact that these teachers explicitly shared *how* they are grappling with an issue provided other participants with a window on the reasoning employed, allowing others to react to that reasoning.

Inviting others' participation. The teachers also commended each other for their comments and invited others to participate or to respond to their postings. The positive comments and invitations implied that they valued the need for others' perspectives as useful, rational beliefs about a topic, an enactment of Davidson's (1984) principle of charity. For example, in discussing the topic of future employment in the job market, one student reacted to another student's description of an interview with a school administrator about her hiring practices:

> I liked what you said here.... First of all, way to ask a relevant questions. Along with finding hope in her answer, I'd like to pose an equally practical question. When and how should we be going about searching out opportunities for our own future employment? I am lucky to have a few friends in high places when it comes to the job-search issue, but I think it would be wonderful to be getting some direction on this subject in class. Anyone else have any insights or information for me???

And, by framing their postings in a tentative, exploratory manner—as "passing theories" (Davidson 1984), the teachers were inviting or implying the need for further verification--agreements or disagreements--from their peers. For example, in discussing the topic of grading writing, one teacher formulated his position on the need to provide feedback during the entire composing process:

> So, my two cents: I kind of see grading as a process that begins when the paper is assigned and ends when we hand back that last draft. Plus, it bears great weight (some insist that grading should be done away with in comp classes) in terms of the whole process, their process, of addressing and completing a writing assignment. Does this make sense to anyone?

In his positing, he hedges his comments with words such as "my two cents" and "kind of see." He also notes that others hold different perspectives on grading. And, his final invitation, "Does this make sense to anyone?" implies that he himself is trying to "make sense" out of his own ideas about evaluating writing. His invitation evoked a number of reactions in which teachers mutually explored the issue of evaluating writing:

Engaging in word/role play. The teachers also frequently engaged in "double-voiced" word play (Bakhtin, 1981), mimicking or parodying persons or discourses. Within the course, the teachers had also participated in a large-group role-play based on the 2000 Presidential election in which they adopted various roles and exchanged written memos with each other. They compared their WebCT exchange with this role-play session in terms of using written texts to engage in verbal play through writing. As one teacher noted:

> The experiences with WebCT has really opened up my ideas on communication and possibilities therein...I think both WebCT and the role play offer something priceless to learning, i.e., play. It's learning of and appreciation for multiplicity. There were so many contexts overlapping in that classroom that multiple uses and abuses are inevitable, and, I think, productive. The same is true for the WebCT.

This dialogic word-play included intertextual references to stances and discourses operating in the group and the teacher education program. By mimicking or parodying the language of these stances or discourses, student were formulating oppositional stances reflecting their own beliefs and ideas about teaching and learning.

Self-reflection on the process. Teachers also explicitly reflected on or described their stances or attitudes adopted in their postings. In some cases, they apologized for repeating themselves, making overly assertive

statements, or sharing complaints. For example, one student noted: "Whoops, I just browsed back up the thread and realized I'm repeating myself!" After posting a long message, one student commented, "Sorry to drop such a wide load here on the CT, but it was cathartic." They also valued the fact that they could openly express their opinions within their group without necessarily being concerned about offending others. One student noted, "could you just imagine if we were afraid of speaking our souls for fear of offending someone. Our class would be pretty damn quiet if that were the case."

A Korean student noted that the site served to foster development of open expression, something she finds lacking in her Korean student peers: "we are too concerned about hurting others people's feelings to think out loud…I think Korean students have to learn to be more assertive in order to exchange their thoughts."

Teachers also noted some of the difficulties specific to participating on a bulletin board discussion. One teacher commented on the difficulty of conveying her attitudes: "I don't know exactly how or why, but threaded discussions transform words. Unless the writer is incredibly skilled, the tone is hard (if not impossible) to communicate. Perhaps it is the instantaneous nature of it that is its main draw and downfall…? Her comment suggests that some participants had difficulty communicating their attitudes in the exchanges.

The teachers therefore used their exchanges on the WebCT bulletin board discussion as a tool for mutually formulating strategies for coping with various issues associated with teaching. Through their participation in these exchanges, they were learning to employ computer-mediated communication as a tool for the literacy practices of displaying spontaneous thinking, inviting others' participation, adopting an exploratory stance, engaging in word/role play, and reflecting on the process.

Summary

The results of this study indicated that the teachers and middle-school students were employing the technology tools of hypermedia production and web-based communication to engage in literacy practices involved in their multi-genre writing project and in communicating with each other. These tools served to mediate the uses of various literacy practices within the larger activity system of teacher education, whose object is to assist teachers to acquire those practices involved in working effectively with students.

The teachers used the Inspiration™ and Storyspace™ tools to define intertextual and hypertextual connections between the texts included in their multi-genre writing project. These hypermedia tools allowed teachers to combine written texts, images, sounds, and video to portray the characteristics of a person in a web-based production for sharing with others, including their students. Creating these hypermedia productions in a co-inquiry project with their students also helped teachers learn how to model the literacy practices of making intertextual or hypertextual connections for students, an important teaching strategy.

With the increased focus on multi-media and hypertext communication in literacy education, English/language arts teachers need to acquire an ability to use this tool as part of their literacy instruction. Teachers also need to be able to employ links that go beyond just illustration to engage in critical interrogation (McKillop & Myers, 1999). One limitation of this project remains the relatively high cost of the Storyspace™ software for large-scale use in schools. At the same time, other, less expensive hypermedia software such as Hyperstudio™ or HyperCard™ can be used as an alternative.

The teachers and students used the web-based communication site as a tool for establishing social relationships and for planning their multi-genre writing projects. This site provided teachers with continuous, on-going interaction with their students, something often lacking in practicum experiences with infrequent school visits. The students expressed a high level of engagement with this site, expressing disappointment when they did not receive responses from their teachers. The written exchange allowed teachers to model a range of literacy practices, particularly self-disclosure about their own lives and posing questions about the project, practices students then demonstrated in their own responses.

One problematic aspect of the exchange was the fact that the teachers dominated the interactions by a ratio of four to one. One possible explanation of this disparity was that the students had minimal access to computers in their school and simply did not have the time to write extensive answers. While students could also access the site from their homes, many students did not have computer access in their homes. Another factor may have been that some students had minimal writing skills; limiting the amount they were able to write. The fact that the students wrote longer entries when they were discussing their own lives and shorter entries when they were discussing their projects suggests that teachers employing this tool need to include a focus on autobiographical topics, as well as topics related to tasks. There were also marked gender differences, with female teachers eliciting more participation from students than male teachers through uses of "personal" connections, suggesting the need for teachers of both genders to employ such connections.

Through their participation on the WebCT bulletin board, teachers were recognizing how participating in an active, on-line community helped them explore issues and concerns related to education. Given this experience, they may then be more likely to participant in similar web sites or employ such sites in their own teaching. And, through that participation, they were employing a number of literacy practices that they could model as participants in teacher/student web-communication.

References

Bakhtin, M. (1981). *The dialogic imagination*. Ed. Michail Holquist. Austin: University of Texas Press.

Barab, S. & Schatz, S. (2001). *Using Activity Theory to conceptualize online Community and Using Online Community to Conceptualize Theory*. Paper presented at the American Educational Research Association in Seattle, WA.

Barthes, R. (1970). S/Z. London: Cape.

Beach, R., & Lundell, D. (1998). Early adolescents' use of computer-mediated communication in writing and reading. In D. Reinking, M.McKenna, L. Labbo, R. Kieffer (Eds.), *Handbook of Literacy and Technology* (pp. 93-112). Mahwah, NJ: Erlbaum, 1998.

Beach, R., & Myers, J. (2001). *Inquiry-Based English instruction: Engaging students in life and literature*. New York: Teachers College Press.

Beach, R., & Phinney, M. (1998). Framing literary text worlds through real-world social negotiations. *Linguistics and Education, 9*(2), 159-198.

Bergvall, V., & Remlinger, K. (1996). Reproduction, resistance and gender in educational discourse: The role of critical discourse analysis. *Discourse & Society, 7*(4), 453-479.

Bloome, D., & Egan-Robertson, A. (1993). The social construction of intertextuality in a classroom reading and writing lessons. *Reading Research Quarterly, 28*, 304-333

Bolter, J. D. (1998). Hypertext and the question of visual literacy. In D. Reinking, M. McKenna, L. Labbo, & R. Kieffer (Eds.), *Literacy and technology: Transformations in a post-typographic world*(pp. 3-14). Mahwah, NJ: Erlbaum.

Bolter, J.D., Smith, J., & Joyce, M. (1990). *Storyspace*. Cambridge, MA: Eastgate.

Bruce, B. C., & Davidson, J. (1996). An inquiry model for literacy across the curriculum. *Journal of Curriculum Studies*, 28 (3), 281-300.

Bruce, B. C., & Easley, J. A., Jr. (2000). Emerging communities of practice: Collaboration and communication in action research. *Educational Action Research*, 8 (2), 243-259.

Bruce, B. C., & Levin, J. (1997). Educational technology: Media for inquiry, communication, construction , and expression. *Journal of Educational Computing Research, 17*(1), 79-101.

Cole, M. (1996). *Cultural psychology*. Cambridge, MA: Harvard University Press.

Cole, M. (1999). Cultural psychology: Some general principles and a concrete example. In Y. Engestrom, R. Miettinen, and R. Punamaki (Eds.), *Perspectives on activity theory* (pp. 87-106). New York: Cambridge University Press.

Dasenbrook, R. W. (2001). *Truth and consequences: Intentions, conventions, and the new thematics*. University Park, PA: Pennsylvania State University Press.

Davidson, D. (1984). *Inquiries into truth and interpretation*. Oxford: Clarendon Press.

Duguay, K. (1999). The pedagogical and electronic contexts of composing in hypermedia. In C. DeWitt, & K. Strasma (Eds.), *Contexts, Intertexts, and Hypertexts*(pp. 15-38). Cresskill, NJ: Hampton Press.

Engestrom, Y. (1987). *Learning by expanding: An activity theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago: Aldine Publishing.

Jonassen, D. (2000). *Computers as Mindtools for Schools: Engaging Critical Thinking*. Columbus: Prentice Hall.

Knoeller, C. (1998). *Voicing ourselves: Whose words we use when we talk about books*. Albany, NY: SUNY Press.

Landow, G. P. (1997). *Hypertext 2.0: The convergence of contemporary critical theory and technology*. Baltimore: Johns Hopkins Press.

Lewis, C., & Fabos, B. (1999, Dec. 4). *Chatting on-line: Uses of instant message communication among adolescent girls*. Paper presented at the National Reading Conference, Orlando.

McKillop, A. M., & Myers, J. (1999). The pedagogical and electronic contexts of composing in hypermedia. In S. DeWitt & K. Strasma (Eds.), *Contexts, intertexts, and hypertexts* (pp. 65-116). Cresskill, NJ: Hampton Press.

McNamee, S. (1996). Therapy and identity construction in a postmodern worlds. In D. Grodin & T. Lindlof (Eds.), *Constructing the self in a mediated world* (pp. 141-155). Thousand Oaks, CA: Sage.

Merriam, S. (1998). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass Inc.

Myers, J., & Beach, R., (2001). Hypermedia authoring as critical literacy. Journal of Adolescent & Adult Literacy, 44(6), pp. 538-546.

Myers, J., Hammett, R., & McKillop, A. M. (1998). Opportunities for critical literacy and pedagogy in student-authored hypermedia. In D. Reinking, M. McKenna, L. Labbo, & R. Kieffer (Eds.), *Literacy and technology: Transformations in a post-typographic world* (pp. 63-78). Mahwah, NJ: Erlbaum.

Myers, J., Hammett, R., & McKillop, A.M. (2000). Connecting, Exploring, and Exposing the Self in Hypermedia Projects. In M. Gallego & S. Hollingsworth (Eds.), *What Counts as literacy: Challenging the School Standard* (pp. 85-105). New York: Teachers College Press.

Patterson, N. (2000). Weaving a narrative: From teens to string to hypertext. *Voices from the Middle, 7* (3), 41-47.

Perkins, D. N. (1986). *Knowledge as design*. Hillsdale, NJ: Erlbaum.

Peyton, J., & Staton, J. (1993). *Dialogue journals in the multilingual classroom: Building language fluency and writing skills through writing interaction*. Norwood, NJ: Ablex.

Porter, K. (2001). A pedagogy of charity: Donald Davidson and the student-negotiated composition classroom. *College Composition and Communication, 52*(4), 574-611.

Romano, T. (2000). *Blending genre, altering style*. Portsmouth, NH: Heinemann.

Russell, D. (1997). Rethinking genre in school and society: An activity theory analysis. *Written Communication, 14*(4), 504-554.

Ryan, G. (1999). "Epistemic Conversations: Creating Socratic Dialogue in Hypertext," In S. DeWitt & K. Strasma (Eds.), *Contexts, intertexts, and hypertexts*(pp. 65-116). Cresskill, NJ: Hampton Press.

Schallert, D., et al. (2001). *What does it mean to be psychologically engaged in an electronically- mediated classroom discussion*. Paper presented at the meeting of the American Educational Research Association, Seattle.

Short, K., & Harste, J. (1996). *Creating classrooms for authors and inquirers*, 2nd ed. Portsmouth, NH: Heinemann.

Smithson, J., & Dias, F. (1996). Arguing for a collective voice: Collaborative strategies in problem-oriented conversation. *Text, 16*(2), 251-268.

Tannen, D. (1984). *Conversational style: Analyzing talk among friends*. Norwood, NJ: Ablex.

Tannen, D., ed. (1993). *Framing in discourse*. New York: Cambridge University Press.

Taylor, P. (1992). Social epistemic rhetoric and chaotic discourse. In G. Hawisher & P. LeBlanc (Eds.), *Re-imagining computers and composition* (pp. 131-148). Portsmouth, NH: Boynton/Cook.

Vygotsky, L. (1978). *Mind in society: The development of high psychological processes*. Cambridge, MA: Harvard University Press.

Walther, J. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*, 3-43.

Wertsch, J. (1998). *Mind as action*. New York: Oxford University Press.

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